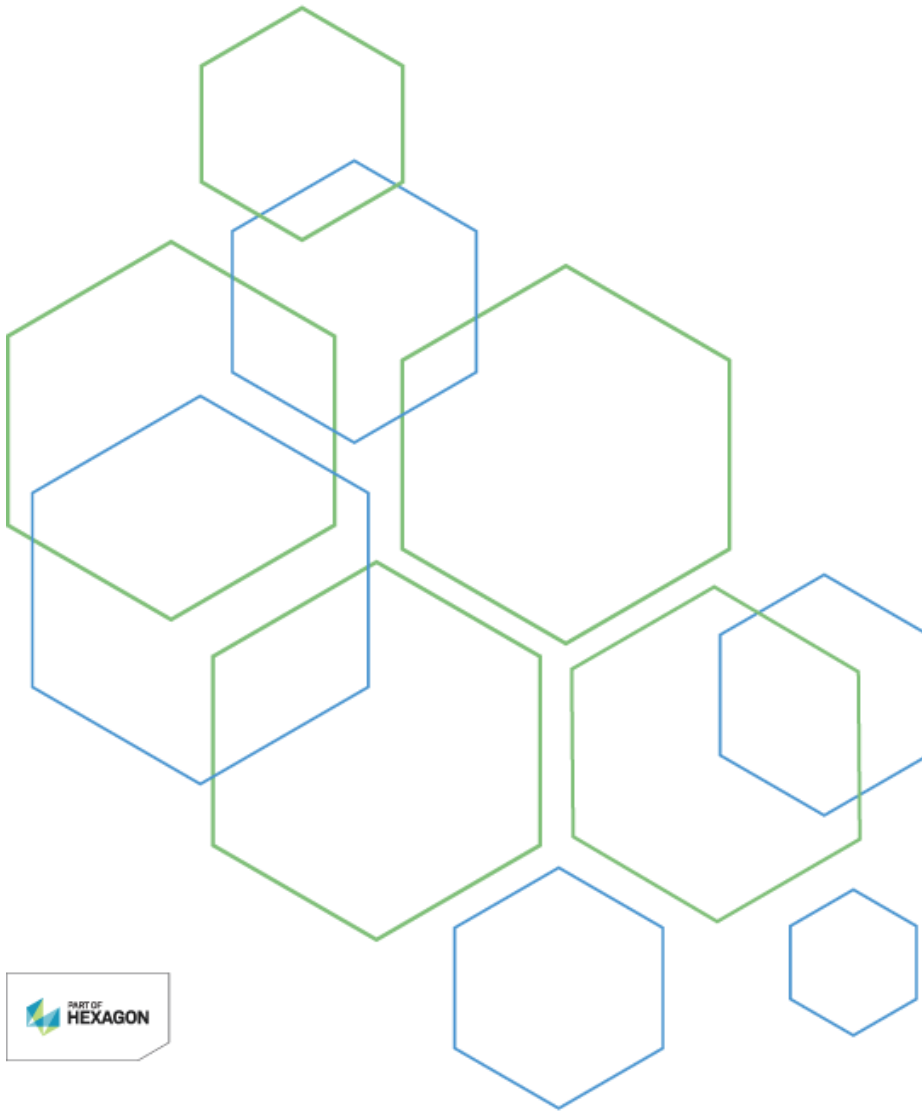


INTERGRAPH®
Smart ➞ **3D**
Systems and Specifications
User's Guide



Version 2016 (11.0)
November 2016

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Preface

This document is a user's guide for the Systems and Specifications functionality of Intergraph Smart™ 3D and provides command reference information and procedural instructions.

Documentation Comments

For the latest support information for this product, comments or suggestions about this documentation, and documentation updates for supported software versions, please visit *Intergraph Smart Support* (<https://smartsupport.intergraph.com>).

What's New in Systems and Specifications

The following changes have been made to the Systems and Specifications task.

Version 2016 (11.0)

- No changes have been made for this release.











SECTION 1


Systems and Specifications

The Systems and Specifications task defines a system hierarchy for your Model design. All design data can then be organized under this hierarchy. In addition to organizing the various piping, equipment, duct, cableway, and structural elements into systems in the hierarchy, you can also assign the allowed specifications for each system. These specifications then limit part selection and placement, based on the specific design needs of your project.

The available system types that can be created are Ducting, Piping, Pipeline, Electrical, Conduit, Structure, Equipment, Generic, Area, and Unit. By organizing design information into systems, the software enables queries and filters by the systems that you have defined. This filtering makes it much simpler to obtain information on only that portion of the total Model design that you need at any given time.

You can start the Systems and Specifications task by clicking **Task > Systems and Specifications**. The Systems and Specifications task has the following task-specific commands:

	New Generic System - Creates a new generic system in the model. For more information, see <i>New Generic System Command</i> (on page 15).
	New Conduit System - Creates a new conduit system in the model. For more information, see <i>New Conduit System Command</i> (on page 16).
	New HVAC System - Creates a new ducting system in the model. For more information, see <i>New HVAC System Command</i> (on page 16).
	New Electrical System - Creates a new electrical system in the model. For more information, see <i>New Electrical System Command</i> (on page 16).
	New Equipment System - Creates a new equipment system in the model. For more information, see <i>New Equipment System Command</i> (on page 16).
	New Piping System - Creates a new piping system in the model. For more information, see <i>New Piping System Command</i> (on page 16).
	New Pipeline System - Creates a new pipeline system in the model. For more information, see <i>New Pipeline System Command</i> (on page 17).
	New Structure System - Creates a new structure system in the model. For more information, see <i>New Structure System Command</i> (on page 23).
	New Unit System - Creates a new unit system in the model. For more information, see <i>New Unit System Command</i> (on page 23).
	New Area System - Creates a new area system in the model. For more information, see <i>New Area System Command</i> (on page 23).

	Define Allowed Specifications - Specifies which specifications are allowed during the design of your model. For more information, see <i>Define Allowed Specifications</i> (on page 36).
	Import Systems Hierarchy from Excel - Creates systems and a system hierarchy based on data from a Microsoft Excel workbook. The Import Systems from Excel command is only available from the Tools menu. For more information, see <i>Import Systems Hierarchy from Excel</i> (on page 24).

SECTION 2

Systems and Specifications Workflow

Before you place such design items as equipment, piping, and structural elements in your model, it is recommended that you create your system hierarchy. The system hierarchy is a collection of various system types. Each system type requires a unique set of properties that includes standard properties required by the software and custom properties that you can define through reference data. Using the delivered reference data workbooks, you can quickly create systems hierarchies and define the appropriate property values, the system parent, and the allowed specifications. You can also use the reference data workbooks to define permission group privileges. For more information, see *Import Systems Hierarchy from Excel* (on page 24).

An alternative method to creating your system hierarchy is using the **New <SystemType> System** command in the Systems and Specifications task. The command allows you to build a hierarchy one system at a time. After a system is placed in the hierarchy, you can define such things as the allowed specifications, the assign permission group, and the status privileges.

After the needed systems are defined, you can use the other tasks to begin placing the design elements in the model.

See Also

Systems and Specifications Common Tasks (on page 9)

Systems and Specifications Common Tasks

The following tasks are used frequently when you create your system hierarchy and define specifications.

Create New Systems

Place systems in the model. For more information, see *Create a new system* (on page 15).

Customize Excel Spreadsheets

Create new systems by editing the sheets in the **ImportData_Sample.xls** and **Pipelines_Sample.xls** workbooks and importing that information into the Systems and Specifications task. For more information, see *Import Systems Hierarchy from Excel* (on page 24).

Define Allowed Specifications

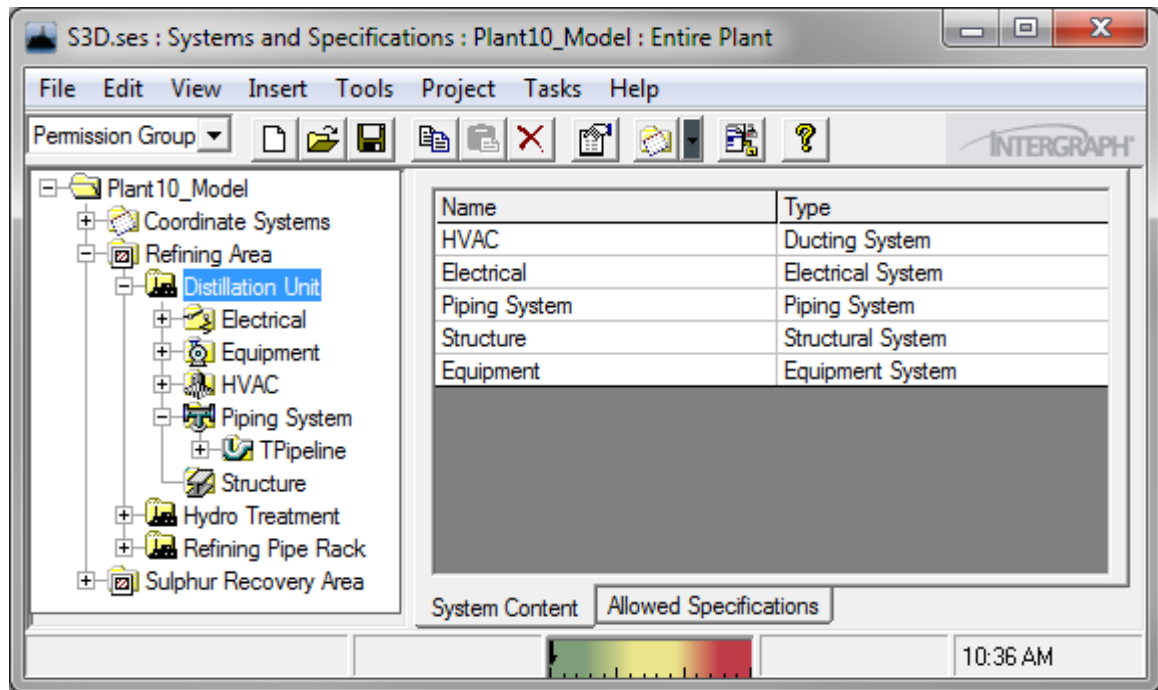
Specify the specifications that the software allows for all items in a given system. For more information, see *Define Allowed Specifications* (on page 36).

Modify the System Hierarchy

Modify the structure and the properties of your system hierarchy. For more information, see *Modify the System Hierarchy* (on page 40).

Understanding the Interface

The basic metaphor for the Systems and Specifications environment is that of a content view of a single model, showing the complete system hierarchy. The system view is Explorer-like, with a tree view on the left for navigating the model hierarchy, and a content view on the right that includes tables for the systems and allowed specifications.



Tree View

The tree view, the left pane of the system view, displays the navigational tree hierarchy for the model, including the complete system breakdown. The tree view does not show individual parts, only the systems.











Content View

The content view, the right pane of the system view, displays the detailed information for the current selection in the tree view. You have the option, by clicking the tabs, to view a spreadsheet list view of the immediate children of the selected model or system, or to view its defined specifications. In the above illustration, for example, the **System Content** tab displays information regarding the children of the selected unit.

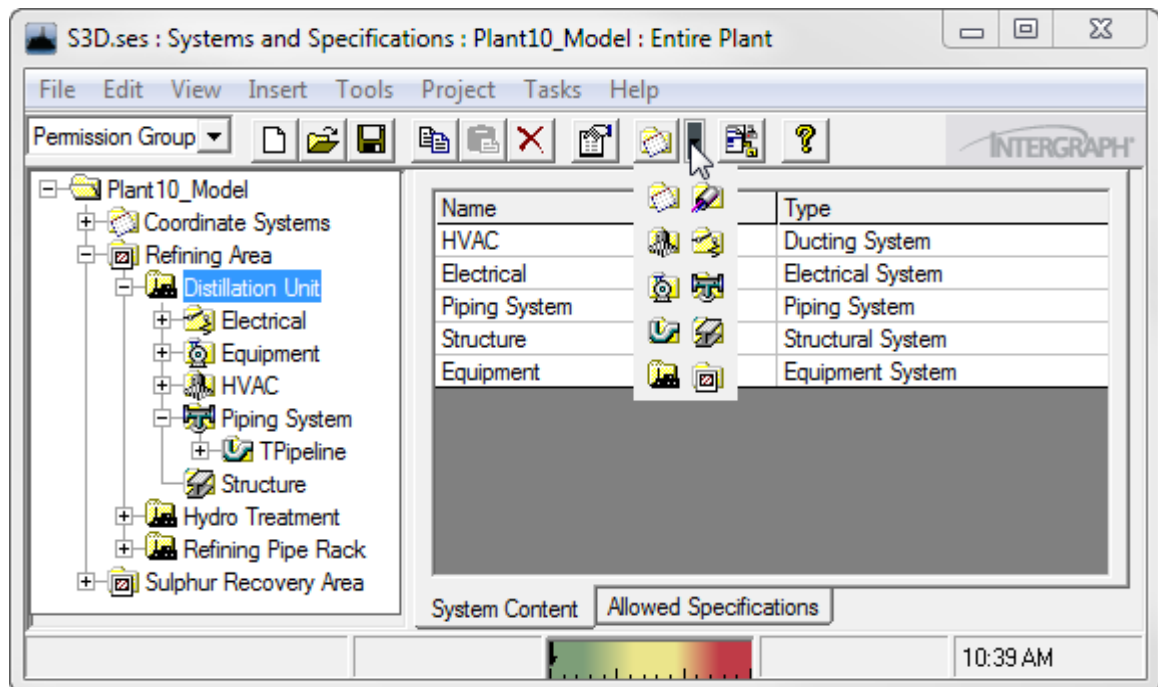
Viewing System Icons

Both the tree view and the toolbar use icons to represent each system type. As you become familiar with these icons, you can quickly identify a system type as it appears in the tree view or as you select the commands on the toolbar to create your system hierarchy.

Icon Meaning

	Generic system
	Conduit system
	HVAC system
	Electrical system
	Equipment system
	Piping system
	Pipeline system
	Structure system
	Unit system
	Area system

The following illustration shows how the system icons are used in the Systems and Specifications environment:





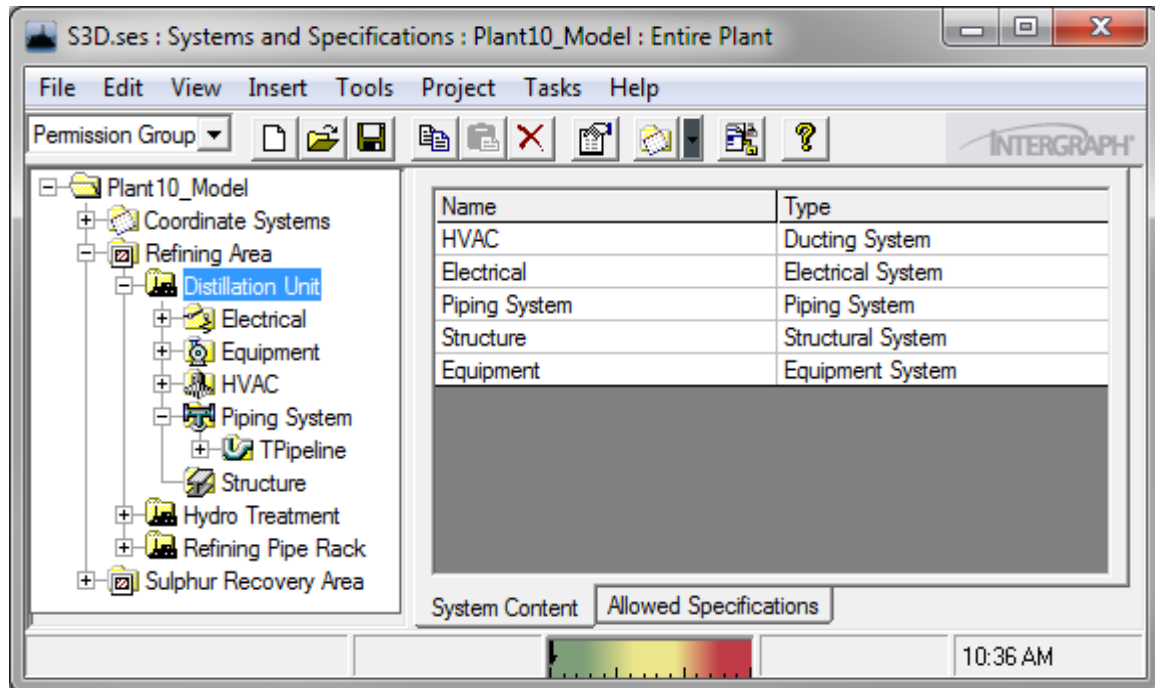
See Also

Systems and Specifications (on page 7)

Create New Systems (on page 14)

Navigate the System Hierarchy

You can use the mouse to navigate the hierarchy. To expand a node so that you can view its contents, including other subsystems, click the  button. To collapse a node so that its contents are hidden, click the  button. You can also expand or close nodes by double-clicking the node name.



- **System Content** tab- Select a node in the tree view (left window pane). In the content view (right window pane), click the **System Content** tab. A list of child systems for that level displays.
- **Allowed Specifications** tab - Select a node in the tree view. In the content view, click the **Allowed Specifications** tab. A list of specifications that can be used for that level displays.

You can use the **Edit > Select Nested** command to select all of the children system of the selected parent system. The **Select Nested** command is also on the right-click shortcut menu.

NOTE When selecting nodes in the system hierarchy, the software displays only the immediate children of the selected system, so objects located further down the hierarchy will not appear in the list view until their direct parent system is selected.

See Also

Systems and Specifications (on page 7)

Create New Systems (on page 14)

Systems and Specifications Naming Rules

The software provides several options for naming Systems and Specifications that you create. These naming rules are listed in the **GenericNamingRules.xls** spreadsheet located in the appropriate install folder: ...\\CatalogData\\BulkLoad\\DataFiles. For more information about creating naming rules, see the *Smart 3D Reference Data Guide*.

DefaultNamingRule

Creates a name based on the system type, Global Workshare location ID, and an index number. For example, the first Piping system created at workshare site 1 is called PipingSystem-1-0001. Use this option to let the software name the Systems and Specifications object.

User Defined

Allows you to define a custom name for the drawing. After selecting this naming rule, type the name for the drawing in the **Name** box.

SECTION 3

Create New Systems


The highest-level icon displayed in the hierarchy is the Model (your plant or ship). You can create systems of different types under the Model itself, as well as under other systems. The software does not apply any rules concerning system types that you can create within a given system, except for Pipeline systems. No type of system may be created under a pipeline system.

The **New System** command creates a new system of a specified type. Each system has at least the following five properties:

- Name
- Name Rule
- Type
- Parent System
- Allowed Specifications

The software provides defaults for all properties of the systems that you create, including the name. The system name that the software automatically generates is determined by the name rule last assigned to that type system during the current session. If the default name rule is in effect, then the software generates the system name with the following format: *<System Type> - <Location> - <Counter>*, where *<Counter>* is the number of the new *<type>* system created in the current session. For example, ConduitSystem-1-0002 indicates that this is the second conduit system created in the current session.

★IMPORTANT The name generator service supplies unique names to items placed in the Model database. The value entered in the **Name rule ID** text box during Site database generation (through the Database Wizard) functions as a substring (an internal ID number) that represents the location at which an item is placed into the model.

After you create a system, you can edit any of its properties except the system type. After the system type is assigned, it cannot be changed. You can edit an existing system by clicking **Properties**  on the horizontal toolbar, by selecting **Edit > Properties**, or by editing the system property fields on the **System Content** tab in the content view (right window pane).

In addition to manually creating systems, when working in an integrated environment, you can retrieve a Plant Breakdown Structure (PBS) document. The software automatically creates the systems that are defined in the retrieved PBS and assigns standard properties for the respective object types. For more information about retrieving data in an integrated environment, see the *Common User's Guide*, accessible from the **Help > Printable Guides** command in the software.

What do you want to do?

- *Create a new system* (on page 15)
 - *Create a new pipeline system* (on page 15)
-

Create a new system

★ **IMPORTANT** The following procedure does not apply to creating a new pipeline system. For more information, see *Create a New Pipeline System* (on page 15).

1. In the tree view, select a node in the hierarchy where you need to add a new system.
2. On the horizontal toolbar, click the new system icon that corresponds to the system type to add.

A new system is added to the hierarchy in the location you specified.


💡 **TIP** You can also right-click anywhere within the system hierarchy and select **Create System** on the shortcut menu. In the cascading list that displays, select the system type to create.

📖 NOTES

- The software automatically assigns other properties based on the defaults that you have specified. If you have not specified a default, the property remains blank.
- This procedure assumes that the Default name rule is being used. If the User-Defined name rule condition has been applied to the new system, the software prompts you to specify a name for the system prior to placing it in the hierarchy. Duplicate names are not allowed under the same parent system.

Create a new pipeline system

★ **IMPORTANT** The following procedure only applies to creating a new pipeline system. For information about creating other system types, see *Create a New System* (on page 15).

1. In the tree view, select a node in the hierarchy where you need to add the pipeline system.
2. Click **New Pipeline System**  on the horizontal toolbar.
3. Define properties for the new pipeline system as needed in the *New Pipeline dialog box* (on page 17).

📖 NOTES

- The pipeline system can only contain pipe runs.
- The software does not allow duplicate names under the same parent system.

New Generic System Command

 Creates a generic system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Conduit System Command



Creates a new conduit system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New HVAC System Command



Creates a ducting system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Electrical System Command



Creates a new electrical system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Equipment System Command



Creates a new equipment system in your system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Piping System Command



Creates a piping system in the system hierarchy at the point selected in the tree view.

You can define default properties for pipe runs created under this piping system. After creating the piping system, edit the properties of the piping system, and use the **Default Property Values** tab to define the defaults.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Pipeline System Command



Creates a new pipeline system in the system hierarchy at the point selected in the tree view.

For more information, see *New Pipeline Dialog Box* (on page 17).

See Also

Create a New Pipeline System (on page 15)

Create New Systems (on page 14)

New Pipeline Dialog Box

Defines properties for a pipeline system in the model hierarchy. This dialog box displays automatically anytime you create a new pipeline system.

For more information, see *Pipeline Tab (New Pipeline Dialog Box)* (on page 17).

See Also

New Pipeline System Command (on page 17)

Create a New Pipeline System (on page 15)

Create New Systems (on page 14)

Pipeline Tab (New Pipeline Dialog Box)

Standard

Name

Displays the name of the pipeline. The pipeline name is based on the **Name Rule** selection. If you specify a name in this box, the software automatically sets the **Name Rule** box to **User Defined**.

Name Rule

Specifies the naming rule to use to name this pipeline. You can select one of the listed rules or specify the pipeline name yourself in the **Name** box.

Specification

Identifies the pipe specification the software uses to control this pipe run. Only those pipe specifications that are allowed in the pipeline that you selected appear in this list. You assign pipe specifications to pipeline systems in the System and Specifications task. You define pipe specifications in the reference data. See the *Piping Reference Data Guide* for more information on defining pipe specifications.

Minimum Slope

Displays the slope for the pipe run. You can specify the slope as a ratio, a percentage, or in degrees.

- As a ratio, if a run drops 1/4" for every foot of horizontal distance, specify the slope as **1/4"/1'-0"**.
- As a percentage, if a run drops 1" for every 10" of horizontal distance, specify the slope as **10%**.
- In degrees, a five-degree slope can be specified as **5deg**.

Nominal Diameter

Specifies the nominal pipe diameter (NPD) for the pipe run. The pipe specification controls the available NPDs in this list. If you select an equipment nozzle as the starting point of your pipe run, the software automatically uses the NPD of the nozzle as the NPD of the pipe run. You can select the NPD units to display on a session file basis using the **Tools > Options** command on the **Units of Measure** tab.

Description

Specifies the description assigned to the selected pipeline system when it was created.

Sequence Number

Specifies the identification number assigned to the selected pipeline system when it was created.

Fluid Requirement

Specifies the alternative fluid requirement for the pipeline system. You can select an alternative fluid requirement from the list.

Fluid Type

Specifies the fluid type for the pipeline system. You can select a fluid type from the list.

Responsibility**Cleaning Responsibility**

Specifies the party responsible for cleaning the object. To change the options on the list, edit the **Cleaning Responsibility** select list in Catalog.

Design Responsibility

Specifies the party responsible for designing the object. To change the options on the list, edit the **Design Responsibility** select list in Catalog.

Fabrication Responsibility

Specifies the party responsible for fabricating the object. To change the options on the list, edit the **Fabrication Responsibility** select list in Catalog.

Installation Responsibility

Specifies the party responsible for installing the object. To change the options on the list, edit the **Installation Responsibility** select list in Catalog.

Painting Responsibility

Specifies the party responsible for painting the object. To change the options on the list, edit the **Painting Responsibility** select list in Catalog.

Requisition Responsibility

Specifies the party responsible for ordering the object. To change the options on the list, edit the **Requisition Responsibility** select list in Catalog.

Supply Responsibility

Specifies the party responsible for delivering the object. To change the options on the list, edit the **Supply Responsibility** select list in Catalog.


Testing Responsibility

Specifies the party responsible for testing on the object. To change the options on the list,

edit the **Testing Responsibility** select list in Catalog.

Insulation and Tracing

Insulation Specification

Specifies the insulation specification for the object. If **Inherited Properties or Spec**  displays in the box, the insulation specification for the object is inherited from the pipe run to which the object belongs.

Defines which insulation specifications are available for which systems in System and Specifications. Insulation specifications are defined in the reference data.

Not Insulated disables the remaining insulation properties.

User Defined indicates that you can specify the remaining insulation properties using custom settings.

More displays a dialog box so that you can select an insulation specification from the reference data. The software then automatically enters information from that insulation specification.

Insulation Purpose

Specifies the purpose of the insulation. If you selected **Not Insulated** in the **Insulation Specification** box, you cannot change the information in the **Insulation Purpose** box. However, if **Insulation Specification** is manually defined, you can select the purpose of the insulation in this box. If **Insulation Specification** is a selected reference data insulation specification, the software reads the purpose from the insulation specification from the reference data and displays it here.

To change the options on the list, edit the **Insulation Purpose** select list in Catalog.

Insulation Material

Specifies the material of the insulation. If you selected **Not Insulated** in the **Insulation Specification** box, you cannot change the information in the **Insulation Material** box. However, if **Insulation Specification** is manually defined, you can select the insulation material to use. If **Insulation Specification** is a selected reference data insulation specification, the software reads the material from the insulation specification as defined in the reference data and displays it here.

Select **More** to select an insulation material from the Catalog. To change the options on the list, edit the **Insulation Material** select list in Catalog.

Insulation Thickness

Specifies the thickness of the insulation. If you selected **Not Insulated** in the **Insulation Specification** box, you cannot change the information in the **Insulation Thickness** box. However, if **Insulation Specification** is manually defined, select the insulation thickness from those values allowed for the material in the reference data. If the value in the **Insulation Specification** field is a selected reference data insulation specification, the software reads the thickness from the insulation specification from the reference data and displays it here.

Insulation Temperature

Specifies the temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example) when specifying this value.

Heat Tracing Requirement

Indicates whether or not the equipment is heat-traced. To change the options on the list, edit the **Heat Tracing Medium** select list in Catalog.

Heat Tracing Type

Specifies the type of heat-tracing. To change the options on the list, edit the **Heat Tracing Medium** select list in Catalog.

Heat Tracing Medium

Specifies the heat-tracing medium to apply to the object. To change the options on the list, edit the **Heat Tracing Medium** select list in Catalog.

Heat Tracing Medium Temperature

Specifies the temperature of the heat-tracing medium. Include the unit of measurement of temperature (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius, for example).

Surface Treatment and Coating**Interior Surface Treatment Requirement**

Specifies the interior treatment requirement for the object. To change the options on the list, edit the **Interior Surface Treatment** select list in Catalog.

Interior Surface Treatment Type

Specifies the interior treatment type for the object. To change the options on the list, edit the **Interior Surface Treatment** select list in Catalog.

Exterior Surface Treatment Requirement

Specifies the exterior treatment requirement for the object. To change the options on the list, edit the **Exterior Surface Treatment** select list in Catalog.

Exterior Surface Treatment Type

Specifies the exterior treatment type for the object. To change the options on the list, edit the **Exterior Surface Treatment** select list in Catalog.

Cleaning Requirement

Specifies the cleaning requirement for the object. To change the options on the list, edit the **Cleaning Requirement** select list in Catalog.

Steamout Requirement

Specifies the steamout requirement for the object. To change the options on the list, edit the **Steamout Requirement** select list in Catalog.

Steamout Pressure

Specifies the steamout pressure for the object. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Steamout Temperature

Specifies the steamout temperature for the object. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Auxiliary Treatment Requirement

Specifies the auxiliary treatment requirement. To change the options on the list, edit the **Auxiliary Treatment** select list in Catalog.

Auxiliary Treatment Type

Specifies the auxiliary treatment type for the object. To change the options on the list, edit the **Auxiliary Treatment** select list in Catalog.

Interior Coating Requirement

Specifies the interior coating requirement for the object. To change the options on the list, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Interior Coating Type

Specifies the type of interior coating for the object. To change the options on the list, edit the **Coating Type** sheet in the **AllCodeLists.xls** workbook in the reference data.

Interior Coating Area

Specifies the area of the interior coating for the object.

Exterior Coating Requirement

Specifies the coating requirement for the object. To change the options on the list, edit the **Coating Type** select list in Catalog.

Exterior Coating Type

Specifies the type of coating for the object. To change the options on the list, edit the **Coating Type** select list in Catalog.

Exterior Coating Area

Specifies the area of the coating for the object.

Coating Color

Specifies the color of the object coating. To change the options on the list, edit the **Coating Color** select list in Catalog. Smart 3D includes this property in the painting area report.

Testing**Testing Requirements**

Specifies the type of non-destructive testing required for welds. To change the options on the list, edit the **Testing Type** select list in Catalog.

Testing Type

Specifies the type of non-destructive weld testing for the welds. To change the options on the list, edit the **Testing Type** select list in Catalog.

Testing Percentage

Specifies the percentage of the welds on this pipe run that are to be tested. This option is available only if you are viewing pipe run properties.

Temperature and Pressure**★ IMPORTANT**

- Temperature and pressure values are controlled by **UndefinedServiceLimitsruleOpt**, which is available on the **DefaultProjectOptions** sheet in the **Piping Specification.xls** workbook. If this option is set to **5**, then you must specify temperature and pressure values for all the pipe runs. If this option is set to **10**, the software displays a warning: "No

Temperature and pressure data has been defined for the pipe run being modeled. As a result, compliance with the temperature/pressure service limits as defined in the piping specification cannot be confirmed. Do you want to continue modeling the pipe run anyway?"

- If your pipe specifications are material-driven, it is still recommended that you specify at least one set of temperature and pressure values for the pipe run.

Design Maximum Temperature

Specifies the maximum design temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Design Minimum Temperature

Specifies the minimum design temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Design Maximum Pressure

Specifies the maximum design pressure. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Operating Maximum Temperature

Specifies the maximum operating temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Operating Minimum Temperature

Specifies the minimum operating temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Operating Maximum Pressure

Specifies the maximum operating pressure. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Testing Maximum Temperature

Specifies the maximum testing temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Testing Minimum Temperature

Specifies the minimum testing temperature. Include the temperature unit of measure (**K** for Kelvin, **F** for Fahrenheit, or **C** for Celsius for example).

Testing Maximum Pressure

Specifies the maximum testing pressure. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Design Minimum Pressure

Specifies the minimum design pressure. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Operating Minimum Pressure

Specifies the minimum operating pressure. Include the pressure unit of measure (**psi** for pounds per square inch for example).

Testing Minimum Pressure

Specifies the minimum testing pressure. Include the pressure unit of measure (**psi** for

pounds per square inch for example).

See Also

Create a New Pipeline System (on page 15)

New Pipeline Dialog Box (on page 17)

New Structure System Command



Creates a new structural system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Unit System Command



Creates a new unit system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

New Area System Command



Creates a new area system in the system hierarchy at the point selected in the tree view.

See Also

Create a New System (on page 15)

Create New Systems (on page 14)

SECTION 4

Import Systems Hierarchy from Excel

Creates systems and a system hierarchy based on data from a Microsoft Excel workbook. You can create any type of system. Each system class can have its own set of properties, either default or user-defined.

The software provides an import utility that allows you to create systems for your model by reading data from a Microsoft Excel workbook. When you install the software, two sample workbooks are delivered locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup. These workbooks contain sample template worksheets and sample system data sheets. Each of these worksheets can be modified to reflect the appropriate property values, the system parent, and the allowed specifications for each system you create.

Each system that you create requires a unique set of properties that includes the software-required properties as defined in the reference data. The workbooks use a different sheet for each different system type. Each column in a particular sheet corresponds to a property.

The import utility is on the **Tools** menu. Before starting the import process, you are prompted to specify a Microsoft Excel workbook to process. The utility reads data from the workbook and either creates a new system or updates an existing system, as is explained in the following:

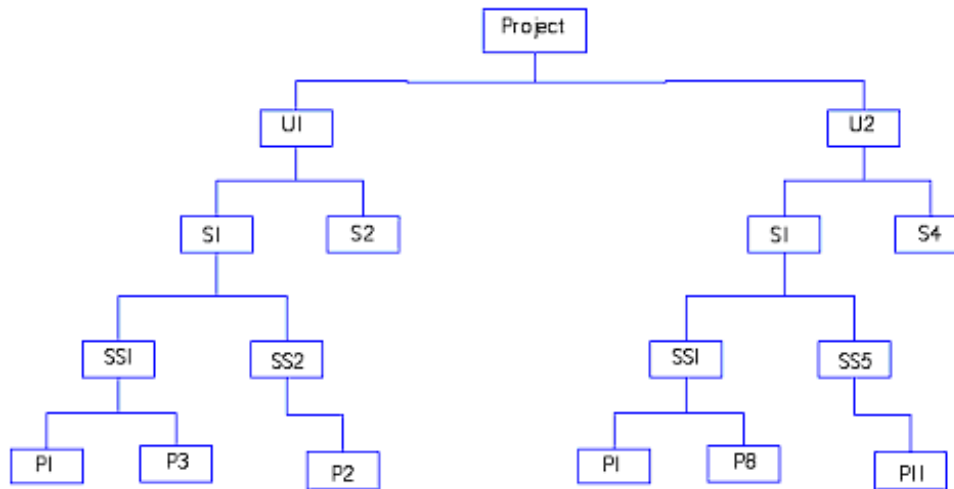
- Data from the workbook is compared against the Model database, and if the system does not currently exist in the database, the new system is created.
- If the system already exists, the existing system is updated.

Systems defined in the workbook are created in the order in which they are defined in the workbook. In turn, each sheet in the workbook is completely processed before the next sheet. On individual sheets, rows are processed in order (from the top down).

In order to function properly, the parent system is created before the child. For example, the following system types would be on different sheets:

- Units
- Piping Systems
- Piping Systems (sub-systems)
- Pipelines

The following illustration demonstrates the need for providing an absolute parent tree when specifying the parent system in the workbook.



In this illustration, if you want to update Pipeline P1, the parent path up to the unit level is required (Parent system=SS1/S1/U1). If you want to update Pipeline P11, the path required to find a unique Parent system is SS5.

Leaving the **Allowed Specifications** field blank causes the system to use the same values as the Parent system; otherwise, filling in values will set the specifications. For example, if you want to add Pipeline 23 to Piping system SS5 but do not specify an allowed specification, the system sets the allowed specification of Pipeline 23 to the same values as the Parent system (SS5).

See Also

ImportData_Sample Workbook (on page 27)

Pipelines_Sample Workbook (on page 34)

Import Systems Hierarchy from Excel Dialog Box (on page 26)

Import systems from Excel

1. Open Microsoft Excel, and modify the workbook file as needed.
2. Save your changes, and exit Microsoft Excel.
3. Click **Start > All Programs > Intergraph Smart 3D > Smart 3D**.
4. In the software, click **Tasks > Systems and Specifications**.
5. Click **Tools > Import Systems Hierarchy from Excel**.
6. In the *Import Systems Hierarchy from Excel Dialog Box* (on page 26), specify the Excel file to import.
7. Make any additional changes as needed.
8. Click **Import** to begin the import process.

The import utility begins reading data from the specified workbook.

NOTES

- The software delivers two sample Excel files, **ImportData_Sample.xls** and **Pipelines_Sample.xls**, locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.
- During the import process, data from the spreadsheet is compared against the Model database. If the system does not currently exist, then the new system is created. If the system exists in the Model database, then the existing system is updated.
- Systems defined in the spreadsheet are created in the order that they are defined in the spreadsheet.
- A log file is generated during the import process. This file indicates whether or not a row is imported successfully and specifies the reason for any failed imports.

See Also

Import Systems Hierarchy from Excel Dialog Box (on page 26)

Import Systems Hierarchy from Excel Dialog Box

Sets options for specifying the Microsoft Excel workbook to process for import.

Excel files

Specifies the Microsoft Excel workbook the Import utility will process.

Add

Opens **Windows Explorer** and allows you to navigate to the location of the Microsoft Excel workbook.

Delete

Removes the selected Microsoft Excel workbook from the Excel files list.

Open

Opens Excel and displays the contents of the specified spreadsheet. If multiple Microsoft Excel workbooks have been specified, you must select one from the Excel files list.

Log file

Specifies the default location of the log file generated during the import process. You can use the **Browse** button to specify an alternative location.

Create a system hierarchy

Imports the system hierarchy with the appropriate property values, the system parent, and the allowed specifications as outlined in the Excel file.

Append pipelines to existing system hierarchy

Modifies systems to the existing hierarchy.

Import

Initiates the import process.

Review Log

Opens the log file that was generated during the import process. The log file indicates whether or not a row was imported successfully. If a row in the spreadsheet fails to be imported, the log file specifies the reason for the failed import.

Reset

Clears the contents of the dialog box.

Cancel

Closes the dialog box without processing the import utility.

See Also

Import Systems Hierarchy from Excel (on page 24)

Import Systems from Excel (on page 25)

ImportData_Sample Workbook

Sample templates for defining system hierarchies and various system types are included in the **ImportData_Sample.xls** workbook.

The software delivers the **ImportData_Sample.xls** workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

See Also

Air System Sheet (on page 27)

FO Transfer System Sheet (on page 29)

FO Service System Sheet (on page 30)

Import Systems Hierarchy from Excel (on page 24)

TEMPLATE_PIPELINE Sheet (on page 33)

TEMPLATE_SYSTEM_HIERARCHY Sheet (on page 31)

Air System Sheet

The **Air System** sheet on the **ImportData_Sample.xls** defines the properties of an air system. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

Pipeline

Specify a name for the pipeline. The name must be unique throughout the life cycle of the model.

Description

Type a description for the pipeline.

Sequence

Type an identification number for the pipeline.

Fluid_System

Specify the code list/short description of the fluid system. The fluid system short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid System Short Description** column. You can also locate the fluid system by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid System Short Description** column.

Fluid_Code

Type the short description of the fluid code to make available. The fluid code short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid Code Short Description** column. You can also locate the fluid code by looking in the Catalog task at the ..\Select Lists\Fluid code node. You need the text in the **Fluid Code Short Description** column.

PSPEC

Specify the piping specification (piping material class) name, for example, 1C0841. Ten piping material classes are delivered with the default catalog. Many more piping material classes are delivered in the **Piping Specification.xls** workbook. You can also see which piping material classes are available by looking in the Catalog task at the ..\Piping\Piping Specification\Piping Material Classes node. You need the name in the **Spec Name** column.

PSPEC_VER

Type the revision number of the piping materials class. This information is located in the version column of the **Piping Specification.xls** workbook. If you have enabled the **Piping Spec Version Management Option** in the **Model Options** node, the text that you copy from here is appended to the end of the piping specification name. For example, if the piping specification is originally named 1C0100, the piping specification with the revision is named "1C0100, Rev: <text>".

ISPEC

Specify the insulation specification name. You can identify available insulation specifications by looking in the Catalog task at the ..\Piping\Insulation\Specifications node. You need the name in the **Name** column.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull, Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

ImportData_Sample Workbook (on page 27)

FO Transfer System Sheet

The **FO Transfer System** sheet on the **ImportData_Sample.xls** defines the properties of fuel oil transfer system. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

Pipeline

Specify a name for the pipeline. The name must be unique throughout the life cycle of the model.

Description

Type a description for the pipeline.

Sequence

Type an identification number for the pipeline.

Fluid_System

Specify the code list/short description of the fluid system. The fluid system short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid System Short Description** column. You can also locate the fluid system by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid System Short Description** column.

Fluid_Code

Type the short description of the fluid code to make available. The fluid code short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid Code Short Description** column. You can also locate the fluid code by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid Code Short Description** column.

PSPEC

Specify the piping specification (piping material class) name, for example, 1C0841. Ten piping material classes are delivered with the default catalog. Many more piping material classes are delivered in the **Piping Specification.xls** workbook. You can also see which piping material classes are available by looking in the Catalog task at the *..\Piping\Piping Specification\Piping Material Classes* node. You need the name in the **Spec Name** column.

PSPEC_VER

Type the revision number of the piping materials class. This information is located in the version column of the **Piping Specification.xls** workbook. If you have enabled the **Piping Spec Version Management Option** in the **Model Options** node, the text that you copy from here is appended to the end of the piping specification name. For example, if the piping specification is originally named 1C0100, the piping specification with the revision is named "1C0100, Rev: *<text>*".

ISPEC

Specify the insulation specification name. You can identify available insulation specifications by looking in the Catalog task at the *..\Piping\Insulation\Specifications* node. You need the name in the **Name** column.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull,

Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

ImportData_Sample Workbook (on page 27)

FO Service System Sheet

The **FO Service System** sheet on the **ImportData_Sample.xls** defines the properties of a fuel oil service system. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

Pipeline

Specify a name for the pipeline. The name must be unique throughout the life cycle of the model.

Description

Type a description for the pipeline.

Sequence

Type an identification number for the pipeline.

Fluid_System

Specify the code list/short description of the fluid system. The fluid system short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid System Short Description** column. You can also locate the fluid system by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid System Short Description** column.

Fluid_Code

Type the short description of the fluid code to make available. The fluid code short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid Code Short Description** column. You can also locate the fluid code by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid Code Short Description** column.

PSPEC

Specify the piping specification (piping material class) name, for example, 1C0841. Ten piping material classes are delivered with the default catalog. Many more piping material classes are delivered in the **Piping Specification.xls** workbook. You can also see which piping material classes are available by looking in the Catalog task at the *..\Piping\Piping Specification\Piping Material Classes* node. You need the name in the **Spec Name** column.

PSPEC_VER

Type the revision number of the piping materials class. This information is located in the

version column of the **Piping Specification.xls** workbook. If you have enabled the **Piping Spec Version Management Option** in the **Model Options** node, the text that you copy from here is appended to the end of the piping specification name. For example, if the piping specification is originally named 1C0100, the piping specification with the revision is named "1C0100, Rev: *<text>*".

ISPEC

Specify the insulation specification name. You can identify available insulation specifications by looking in the Catalog task at the ..\Piping\Insulation\Specifications node. You need the name in the **Name** column.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull, Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

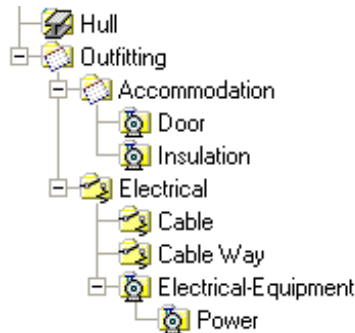
ImportData_Sample Workbook (on page 27)

TEMPLATE_SYSTEM_HIERARCHY Sheet

The **TEMPLATE_SYSTEM_HIERARCHY** sheet in the **ImportData_Sample.xls** workbook allows you to create a system hierarchy that can be imported into the Systems and Specifications task. Take, for example, the following system hierarchy created in Excel:

HEAD	SYSTEM1	SYSTEM2	SYSTEM3	SYSTEM4	SYSTEM5	TYPE	PERMISSION_GROUP
START	String	String	String	String		String from List	String
	Hull					Structure System	Permission Group1
	Outfitting					Generic System	Permission Group1
		Accommodation				Generic System	Permission Group1
			Door			Equipment System	Permission Group1
			Insulation			Equipment System	Permission Group1
		Electrical				Electrical System	Permission Group1
			Cable Way			Electrical System	Permission Group1
			Cable			Electrical System	Permission Group1
			Electrical-Equipment			Equipment System	Permission Group1
				Power		Equipment System	Permission Group1
		HVAC				HVAC System	Permission Group1
			Duct Support			HVAC System	Permission Group1
			Duct			HVAC System	Permission Group1
				Accommodation		HVAC System	Permission Group1
				Machinery		HVAC System	Permission Group1
		Piping				Piping System	Permission Group1
			Piping-Support			Piping System	Permission Group1
			Piping			Piping System	Permission Group1
				Air System		Piping System	Permission Group1
				FO System		Piping System	Permission Group1
					FO System-FO Transfer System	Piping System	Permission Group1
					FO System-FO Service System	Piping System	Permission Group1
					FO System-Equipment	Equipment System	Permission Group1
		Equipment				Equipment System	Permission Group1
		Outfitting Structure				Structure System	Permission Group1
			Foundation			Structure System	Permission Group1
			Door1			Structure System	Permission Group1
END							

When you import the Excel data into the Systems and Specifications task, the system hierarchy resembles the following:



The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

System1

Type the name of the parent system.

System2

Type the name of the child.

System3

Type the name of the child.

System4

Type the name of the child.

System5

Type the name of the child.

Type

Use the drop-down list to select the system type.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull, Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

ImportData_Sample Workbook (on page 27)

TEMPLATE_PIPELINE Sheet

The **TEMPLATE_PIPELINE** sheet on the **ImportData_Sample.xls** defines the properties of a pipeline system. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

Pipeline

Specify a name for the pipeline. The name must be unique throughout the life cycle of the model.

Description

Type a description for the pipeline.

Sequence

Type an identification number for the pipeline.

Fluid_System

Specify the code list/short description of the fluid system. The fluid system short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid System Short Description** column. You can also locate the fluid system by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid System Short Description** column.

Fluid_Code

Type the short description of the fluid code to make available. The fluid code short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid Code Short Description** column. You can also locate the fluid code by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid Code Short Description** column.

PSPEC

Specify the piping specification (piping material class) name, for example, 1C0841. Ten piping material classes are delivered with the default catalog. Many more piping material classes are delivered in the **Piping Specification.xls** workbook. You can also see which piping material classes are available by looking in the Catalog task at the *..\Piping\Piping Specification\Piping Material Classes* node. You need the name in the **Spec Name** column.

PSPEC_VER

Type the revision number of the piping materials class. This information is located in the version column of the **Piping Specification.xls** workbook. If you have enabled the **Piping Spec Version Management Option** in the **Model Options** node, the text that you copy from here is appended to the end of the piping specification name. For example, if the piping specification is originally named 1C0100, the piping specification with the revision is named "1C0100, Rev: *<text>*".

ISPEC

Specify the insulation specification name. You can identify available insulation specifications by looking in the Catalog task at the *..\Piping\Insulation\Specifications* node. You need the name in the **Name** column.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull, Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

ImportData_Sample Workbook (on page 27)

Pipelines_Sample Workbook

Sample templates for defining pipeline systems are included in the **Pipelines_Sample.xls** workbook. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

See Also

Import Systems Hierarchy from Excel (on page 24)

ImportData_Sample Workbook (on page 27)

TEMPLATE_PIPELINE Sheet

The **TEMPLATE_PIPELINE** sheet in the **Pipelines_Sample.xls** workbook defines the properties of a pipeline system. The software delivers this workbook locally to *[Product Folder]\SystemsAndSpecs\Import* as part of the default client setup.

Pipeline

Specify a name for the pipeline. The name must be unique throughout the life cycle of the model.

Description

Type a description for the pipeline.

Sequence

Type an identification number for the pipeline.

Fluid_System

Specify the code list/short description of the fluid system. The fluid system short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the **Fluid System Short Description** column. You can also locate the fluid system by looking in the Catalog task at the *..\Select Lists\Fluid code* node. You need the text in the **Fluid System Short Description** column.

Fluid_Code

Type the short description of the fluid code to make available. The fluid code short descriptions are defined on the **AllCodeLists.xls** workbook in the **Fluid Code** sheet in the

Fluid Code Short Description column. You can also locate the fluid code by looking in the Catalog task at the ..\Select Lists\Fluid code node. You need the text in the **Fluid Code Short Description** column.

PSPEC

Specify the piping specification (piping material class) name, for example, 1C0841. Ten piping material classes are delivered with the default catalog. Many more piping material classes are delivered in the **Piping Specification.xls** workbook. You can also see which piping material classes are available by looking in the Catalog task at the ..\Piping\Piping Specification\Piping Material Classes node. You need the name in the **Spec Name** column.

PSPEC_VER

Type the revision number of the piping materials class. This information is located in the version column of the **Piping Specification.xls** workbook. If you have enabled the **Piping Spec Version Management Option** in the **Model Options** node, the text that you copy from here is appended to the end of the piping specification name. For example, if the piping specification is originally named 1C0100, the piping specification with the revision is named "1C0100, Rev: <text>".

ISPEC

Specify the insulation specification name. You can identify available insulation specifications by looking in the Catalog task at the ..\Piping\Insulation\Specifications node. You need the name in the **Name** column.

Permission Group

Type the name of the permission group assigned to the system name, for example, Hull, Accommodation, or Door. You assign permission groups in Project Management.

If you assign a permission group that does not exist, the **Permission Group Validate Result** dialog box displays so that you can correct the entry. Click **Yes**, and the software creates systems in the active permission groups for systems that do not exist in the model. Click **No** to abort the import process.

If you do not have write access for a particular permission group, you cannot create that system or its children. The software continues creating other systems, and then adds to the log file a statement such as, "The permission group 'Permission Group Name' for 'System Name' does not have write access. Systems/objects cannot be created."

See Also

Pipelines_Sample Sheet (on page 34)

SECTION 5

Define Allowed Specifications



Specifies the specifications that are allowed for the model or system. The allowed specifications for a system determine what parts are available for selection and placement within that system. Systems inherit specifications from their parent system, but you can restrict the list of available specifications further by using this command.

The **Define Allowed Specifications** command identifies the specifications that the software allows for all of the items in a given system and includes adding and removing specifications to the model from the Catalog database. Also, you can provide a subset of allowed specifications for each system by restricting the selection allowed by the model as a whole. By default, allowed specifications are inherited, which means that any specifications that are allowed by the parent system are also allowed by the subsystem. At any level of the hierarchy, you can restrict the list of allowed specifications.


You can also add a specification to the list of allowed specifications for a system, provided that the system parent allows the specification that you need to add. Allowed specifications operate in a top-down hierarchy, that is, any specification that you need to allow for a system must be allowed by its parent system. If the system is in the top level of the model hierarchy, the overall model must allow the specification. Allowed specifications must first be defined for the model as a whole before those specifications are available for lower-level systems.


Define Allowed Specifications Dialog Box (on page 37)

What do you want to do?

- *Define allowed specifications* (on page 36)
 - *Delete an allowed specification* (on page 37)
-

Define allowed specifications

1. Select a system from the tree view.
2. Click **Define Allowed Specifications**  on the horizontal toolbar.
*The software displays the **Define Allowed Specifications** dialog box.*
3. Select the specifications to add to the selected system in the **Allowed by parent system** list.
TIP You can select multiple specifications by holding down the CTRL key while clicking on the specifications that you need to define for the system.
4. Click **Add**.
5. Select any specifications that you need to remove from the selected system in the **Allowed for selected system** list.
6. Click **Remove**.


 **TIP** You can remove all of the allowed specifications from the selected system by clicking **Clear All**.


NOTES


- You can also remove an allowed specification from the **Allowed Specifications** tab in the main task window. To do so, select the specification that you need to remove in the list view, and click **Delete** on the horizontal toolbar.
- Clicking **Add All** on the **Define Allowed Specifications** dialog box returns the specifications list to its default state, which allows all specifications defined by the parent system.

Delete an allowed specification

1. In the tree view, select the system whose allowed specifications you want to modify.
2. Click the **Allowed Specifications** tab at the bottom of the content view window.
3. Choose the specification to delete from the list of allowed specifications.

 **TIP** You can select multiple systems by pressing the CTRL key while clicking on other systems.

4. Click **Delete**  on the horizontal toolbar.

 **NOTE** When you delete an allowed specification from a system, you also delete it from all of the subsystems of that system. The specification remains available to all of the parent systems. If you delete an allowed specification at the model level, it remains in the catalog and can be added back into the model in the future, if needed.

Define Allowed Specifications Dialog Box

Sets the available list of specifications for the selected model hierarchy or system. Systems inherit specifications from their parent system, but you can restrict the list of available specifications further by using this dialog box.

Allowed by parent system: <name of parent system>

Displays the specifications nested by specification type. The list of specifications and type is defined by the reference data. The short name is shown in the **Name** column, and a description of the specification displays in the **Description** column. If the Model level was selected when the command was activated, then all of the specifications in the reference data are listed; if a nested system was selected, then only those specifications that are allowed by the system parent are displayed.

Allowed for selected system: <name of selected system>

Displays the current allowed specifications for the selected system.

Add

Allows you to add an allowed specification to the selected system from the list that is permitted by the parent system. A new system inherits all of the allowed specifications from its parent system by default.

Remove

Removes an allowed specification from the list of specifications that are available for the selected system. This specification is still available to the parent system or any other systems that share the same parent.

Clear All

Removes all of the allowed specifications from the list that are available for the selected system. A system must have at least one allowed specification; consequently, you must add at least one specification back to the list of allowed specifications before attempting to exit the dialog box.

Add All

Sets the list of allowed specifications for the selected system to match the specifications of the parent system or, in the case of a top-level system, for the entire model.

See Also

Define Allowed Specifications (on page 36)

SECTION 6

Edit Systems and Specifications

The Systems and Specifications task allows you to modify the structure and the properties of your system hierarchy at any point in the design process. You can move an existing system to the top level of the hierarchy by dragging it to the new parent system, or you can make an existing system the subordinate of another existing system with a few simple operations. You can copy an existing system and paste it to another location in the hierarchy. The system you select in the hierarchy then becomes the parent of the copied system.

In addition to adjusting the overall layout of the hierarchy, you can also make modifications to the properties of the members of the hierarchy. Using the **Properties** command, you can edit the parent, the allowed specifications, and the name of the individual systems.

You can also remove items from the system hierarchy using the **Delete** command. To delete a system, select it in either the tree view or the content view and click **Delete**. The software automatically selects the subsystems and parts nested under the selected system. If you have the permission to delete all of the systems, subsystems, and parts that are selected, then the software removes those objects from the model.

To delete or disassociate a specification from the list of allowed specifications for a system and associated subsystems, select the specifications on the **Allowed Specification** tab in the content view and delete it. If you have permission, and the specification is not the last allowed specification for the system, then the software deletes it.

After the allowed specifications of a system have been changed to differ from the parent, specifications added to the parent are no longer automatically assigned to the child.

What do you want to do?

- *Define default property values* (on page 39)
 - *Modify the system hierarchy* (on page 40)
 - *Delete a system or part* (on page 40)
 - *Edit system properties* (on page 41)
-


Define default property values

1. Select a piping, electrical, or conduit system.
2. Click **Edit > Properties**.
3. Select the **Default Property Values** tab.
4. Using the **Category** option and the properties grid, define the default property values that you want. For more information, see *Default Property Values Tab* (on page 44).
5. Click **Apply** to save your default values.

Modify the system hierarchy

Move a System in the Hierarchy



1. In the tree view, select the system or part to move.
2. Drag and drop the item to its new location.

 **TIP** To move a system to the top of the hierarchy, drag it to the model icon at the top of the system hierarchy.

NOTES

- You must have Write permissions for all of the contents of the system and any subsystems to change the location of it in the system hierarchy.
- If you move a system to a new parent system, then any specifications disallowed from the parent system are removed from the available specifications of the system that you moved.
- To move a system with its children, right-click on the system and click **Nested Systems** on the shortcut menu.

Copy and Paste a System in the Hierarchy

1. In the tree view, select the system or part to copy.
2. Click **Copy**  on the horizontal toolbar.
3. Select a new location in the hierarchy and click **Paste**  on the horizontal toolbar.

NOTES


- You must have Write permissions for all of the contents of the system and any subsystems to change the location of it in the system hierarchy.
- The **Paste** command uses the currently selected system as the parent of the pasted system.
- The default name for the copied system type is used to generate a new name for the pasted system.
- The **Copy** command will only copy the selected system. Nested systems will not be copied.


Delete a system or part

1. In the tree or content view, select the system or part to delete.


TIPS

- You can select multiple systems by pressing the **Ctrl** key while clicking on other systems.
- To select a parent and all of its children, right-click the parent in the tree view or the content view and click **Select Nested** from the shortcut menu (or **Edit > Select Nested**).

2. Click **Delete**  on the horizontal toolbar.


 **NOTE** If you delete a parent system that contains children, then the software displays a confirmation dialog box listing the number of systems and subsystems to be deleted.

Edit system properties

1. In the tree view, select the system to edit.
2. Click **Properties**  on the horizontal toolbar.
3. Select the **General** tab to change the system name, the naming rule, and the location of the system within the hierarchy.
★ IMPORTANT To modify the location of the system, you must have Write access to all of the components contained within the selected system.
4. Select the **Configuration** tab to change the permission group and status of the selected system.
5. Select the **Notes** tab to create or modify text that has been placed in the model.
6. Select the **Default Property Values** tab to define default properties.

NOTE The **Specifications** tab lists all of the specifications that are defined for the selected system. This information cannot be edited from this dialog box.

System Properties Dialog Box

Sets options for a system in the hierarchy. To access system properties, select a system in the hierarchy, and then click **Properties**  on the horizontal toolbar.

Using the <System Name> **Properties** dialog box, you can change the parent system, the name, the naming rule, the status, and the permission groups. You can also view allowed specifications that have been assigned to the selected system. For piping, electrical, and conduit systems, you can define the default property values.

General Tab (on page 41)

Specifications Tab (on page 44)

Default Property Values Tab (on page 44)

Relationship Tab (on page 50)

Configuration Tab (on page 50)

Notes Tab (on page 52)

See Also

Edit Systems and Specifications (on page 39)

Edit System Properties (on page 41)

General Tab

Sets basic options for the currently selected system. You can change the name, the naming convention, or the parent system from this tab. Unless otherwise noted, all other information is read-only.

Category

Select the type of properties that you want to view for the selected system. Currently, you can view the Standard properties of the system or the Weight and CG (Center of Gravity) properties. The weight and center-of-gravity values that display are the sum of total weight and center-of-gravity of all objects in the selected system.

Standard

Name

Specifies the name assigned to the selected system. The software assigns a default name for the system, based on the name rule defined below.

Name Rule

Sets the conventions used in naming new systems in the system hierarchy. System names can be user- defined or automatically generated (default name rule). If the default name rule is selected, then the software remembers the name rule that you used the last time you created the currently selected system type.

Type

Displays the type of system currently selected. This information is read-only.

Unit Code

Specifies the **Unit Code** property. This property is available only when the **Type** is a **Unit System**.

Parent System

Specifies the parent of the selected system in the system hierarchy. You must have write access to all of the members of the selected system in order to change its assigned parent system.

Description

Specifies the description that is assigned to the selected pipeline system when it is created. This option is only available when you view the properties of a pipeline system.

Sequence Number

Specifies the identification number Smart 3D assigned to the selected pipeline system when it was created. This option is only available when you view the properties of a pipeline system.

Fluid Requirement

Specifies the fluid requirement for the pipeline system. To change the options on the list, edit the **Fluid Code** select list in Catalog. This option is only available when you view the properties of a pipeline system.

Fluid Type

Specifies the fluid type for the selected pipeline system. To change the options on the list, edit the **Fluid Code** select list in Catalog. This option is only available when you view the properties of a pipeline system.

Correlation Status

Specifies whether or not the object has been correlated to an object in a P&ID. The list is defined by the EFWCorrelationStatus select list.

Correlation Basis

Specifies whether or not the object is correlated to a P&ID object. The list is defined by the EFWCorrelationBasis select list.

Correlate Object indicates that the object has a correlating object in a P&ID.

No correlation is required indicates that the object does not have a correlating object in a P&ID.

Correlation Approval Status

Specifies whether or not the object is approved with discrepancies in the three-dimensional data compared with design basis data. The list is defined by the EFWCorrelationApprovalStatus sheet in the AllCodelist workbook.

Topology mismatch approved indicates that the object topology mismatch can be ignored.

Data and Topology mismatches approved indicates that the object data and topology mismatches can be ignored.

None indicates that you do not approve a mismatch.

Weight and CG


The weight and center-of-gravity values that display are the sum of total weight and center-of-gravity of all objects in the selected system. The center-of-gravity locations are displayed in global system coordinates along the X-, Y-, and Z-axes.

Dry Weight

Specifies the dry weight of the object.

Wet Weight

Specifies the wet weight of the object.

 **NOTE** For equipment, the **Weight and CG** property **Wet Weight** is the sum of **Dry Weight** and **Water Weight**. The dry weight and water weight values are catalog properties entered on the part sheet for the equipment.

Dry CG X

Specifies the X-axis location of the dry center-of-gravity.

Dry CG Y

Specifies the Y-axis location of the dry center-of-gravity.

Dry CG Z

Specifies the Z-axis location of the dry center-of-gravity.

Wet CG X

Specifies the X-axis location of the wet center-of-gravity.

Wet CG Y

Specifies the Y-axis location of the wet center-of-gravity.

Wet CG Z

Specifies the Z-axis location of the wet center-of-gravity.

Specifications Tab

Displays all specifications that are allowed for the selected system. Assigned specification information is read-only. You can define specifications in the reference data.

Property

Displays the specifications that are allowed for the selected system. The specifications that display depend on what is defined for the selected system and are defined in the reference data. This information is read-only.

Value

Displays values for the corresponding property.

Default Property Values Tab

Sets default property values for piping, electrical, and conduit systems.

Category

Select the category type in which you want to define default properties. Currently, you can select from the following categories: Responsibility, Standard, Surface Treatment and Coating, Testing, Insulation and Tracing, Cable Fill, and Temperature and Pressure.

Standard

Specification

Select the specification that you want to be the default for this system. You may need to use the **Define Allowed Specifications** (on page 36) command before you can select a specification here. You define specifications in the reference data.

Minimum Slope

Specifies the slope for the runs created in this system. You can specify the slope as a ratio, a percentage, or in degrees.

- As a ratio, if a run drops 1/4" for every foot of horizontal distance, specify the slope as **1/4"/1'-0"**.
- As a percentage, if a run drops 1" for every 10" of horizontal distance, specify the slope as **10%**.
- In degrees, a five-degree slope can be specified as **5deg**.

Cable Fill

Fill Efficiency

Displays or defines the efficiency of the stacking of cables in the cableway. You can enter a real number, an integer, or a percent; for example, type 0.9, 90, or 90%.

Signal Type

Displays or defines the cable usage, which is used in tray fill calculations. If you want to add, edit, or remove values that are available for selection, edit the **Signal Type** select list in the **Catalog** task.

Voltage Grade

Displays or defines the voltage grade, which is used in determining the range of voltage that the cableway can carry. If you want to add, edit, or remove values that are available for selection, edit the **Voltage Grade** select list in the **Catalog** task.

Responsibility

Cleaning Responsibility

Select the party responsible for cleaning the object. If you want to add, edit, or remove values that are available for selection, edit the **Cleaning Responsibility** select list in the **Catalog** task.

Design Responsibility

Select the party responsible for designing the object. If you want to add, edit, or remove values that are available for selection, edit the **Design Responsibility** select list in the **Catalog** task.

Fabrication Responsibility

Select the party responsible for fabricating the object. If you want to add, edit, or remove values that are available for selection, edit the **Fabrication Responsibility** select list in the **Catalog** task.

Installation Responsibility

Select the party responsible for installing the object. If you want to add, edit, or remove values that are available for selection, edit the **Installation Responsibility** select list in the **Catalog** task.

Painting Responsibility

Select the party responsible for painting the object. If you want to add, edit, or remove values that are available for selection, edit the **Painting Responsibility** select list in the **Catalog** task.

Requisition Responsibility

Select the party responsible for ordering the object. If you want to add, edit, or remove values that are available for selection, edit the **Requisition Responsibility** select list in the **Catalog** task.

Supply Responsibility

Select the party responsible for delivering the object. If you want to add, edit, or remove values that are available for selection, edit the **Supply Responsibility** select list in the **Catalog** task.

Testing Responsibility

Select the party responsible for testing the weld on the object. If you want to add, edit, or remove values that are available for selection, edit the **Testing Responsibility** select list in the **Catalog** task.

Surface Treatment and Coating

Interior Surface Treatment Requirement

Select the interior treatment requirement for the object. If you want to add, edit, or remove

values that are available for selection, edit the **Interior Surface Treatment** select list in the Catalog task.

Interior Surface Treatment Type

Select the interior treatment type for the object. If you want to add, edit, or remove values that are available for selection, edit the **Interior Surface Treatment** select list in the Catalog task.

Exterior Surface Treatment Requirement

Select the exterior treatment requirement for the object. If you want to add, edit, or remove values that are available for selection, edit the **Exterior Surface Treatment** select list in the Catalog task.

Exterior Surface Treatment Type

Select the exterior treatment type for the object. If you want to add, edit, or remove values that are available for selection, edit the **Exterior Surface Treatment** select list in the Catalog task.

Cleaning Requirement

Select the cleaning requirement for the object. If you want to add, edit, or remove values that are available for selection, edit the **Cleaning Requirement** select list in the Catalog task.

Steamout Requirement

Select the steam out requirement for the object. If you want to add, edit, or remove values that are available for selection, edit the **Steamout Requirement** select list in the Catalog task.

Steamout Pressure

Specify the steamout pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Steamout Temperature

Specify the steamout temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Auxiliary Treatment Requirement

Specify any auxiliary treatment requirement.

Auxiliary Treatment Type

Specify any auxiliary treatment type.

Interior Coating Requirement

Select the interior coating requirement for the object. If you want to add, edit, or remove values that are available for selection, edit the **Coating Type** select list in the Catalog task.

Interior Coating Type

Select the interior coating type for the object. If you want to add, edit, or remove values that are available for selection, edit the **Coating Type** select list in the Catalog task.

Interior Coating Area

Enter total area that the coating covers.

Exterior Coating Requirement

Select the exterior coating requirement for the object. If you want to add, edit, or remove values that are available for selection, edit the **Coating Type** select list in the Catalog task.

Exterior Coating Type

Select the exterior coating type for the object. If you want to add, edit, or remove values that are available for selection, edit the **Coating Type** select list in the Catalog task.

Exterior Coating Area

Enter the total area that the coating covers.

Coating Color

Select the color of the object coating. If you want to add, edit, or remove values that are available for selection, edit the **Coating Color** select list in the Catalog task.

Testing**Testing Requirement**

Specifies whether non-destructive testing of welds is required.

Testing Type

Select the type of non-destructive weld testing for the welds. If you want to add, edit, or remove values that are available for selection, edit the **Testing Type** select list in the Catalog task.

Testing Percentage

Type the percentage of the welds on this pipe run that are to be tested. This option is available only if you are viewing pipe run properties.

Insulation and Tracing**Insulation Specification**

Displays the insulation specification for the object. You define which insulation specifications are available for which systems in the System and Specifications task. You define insulation specifications in the reference data.

Insulation Purpose

Displays the purpose of the insulation. You can define insulation purposes in the Catalog task.

Insulation Material

Displays the material of the insulation. You can define insulation material in the Catalog task.

Insulation Thickness

Displays the thickness of the insulation.

Insulation Temperature

Type the temperature. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Heat Tracing Requirement

Select whether or not the object is heat-traced. If you want to add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** select list in the Catalog task.

Heat Tracing Type

Select the type of heat-tracing. If you want to add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** select list in the Catalog task.

Heat Tracing Medium

Select the heat-tracing medium to apply to the object. If you want to add, edit, or remove values that are available for selection, edit the **Heat Tracing Medium** select list in the Catalog task.

Heat Tracing Medium Temperature

Specify the temperature of the heat-tracing medium. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Temperature and Pressure

If service limits have been defined, you must define one set of pressure/temperature values (**Design Maximum Temperature** and **Design Maximum Pressure**, for example) before you can place the object. The software does not prevent you from defining testing temperatures and pressures that exceed the defined service limits.

Design Maximum Temperature

Specify the maximum design temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Design Minimum Temperature

Specify the minimum design temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Design Maximum Pressure

Specify the maximum design pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Operating Maximum Temperature

Specify the maximum operating temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Operating Minimum Temperature

Specify the minimum operating temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Operating Maximum Pressure

Specify the maximum operating pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Testing Maximum Temperature

Specify the maximum testing temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Testing Minimum Temperature

Specify the minimum testing temperature for the object. Include the temperature unit of measure (K for Kelvin, F for Fahrenheit, or C for Celsius, for example) when specifying this value.

Testing Maximum Pressure

Specify the maximum testing pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Design Minimum Pressure

Specify the minimum design pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Operating Minimum Pressure

Specify the minimum operating pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Testing Minimum Pressure

Specify the minimum testing pressure for the object. Include the pressure unit of measure (psi for pounds per square inch, for example) when specifying this value.

Adding Custom Default Properties

You can add your own custom default properties to this tab by editing the ..\CatalogData\Bulkload\SampleDataFiles\SystemUserDefinedDefaultProperties.xls workbook, and then bulkloading the edited workbook into your Catalog. For more information about bulkloading workbooks, refer to the Model Reference Data Guide, available from **Help > Printable Guide**. Only properties for piping, electrical, and conduit systems can be added to this tab.

The interfaces for the default property values are limited to the following: IJUASASSPipingDefaults, IJUASASSElectircalDefaults, and IJUASASSConduitDefaults. You must use these interfaces for the properties that you want to add to this tab.

The categories for the default property values are limited also. For Piping systems, the categories are: **Standard, Responsibility, Surface Treatment and Coating, Testing, Insulation and Tracing, and Temperature**.

For Electrical systems, the categories are: **Standard, Responsibility, Surface Treatment and Coating, and Cable Fill**.

For Conduit Systems, the categories are: **Standard, Responsibility, Surface Treatment and Coating, and Cable Fill**.

See Also

Define Default Property Values (on page 39)

Relationship Tab

Displays all objects related to the selected object for which you are viewing properties. For example, if you are viewing the properties of a pipe run, the related pipeline, features, parts, associated control points, hangers or supports, and equipment display on this tab. All WBS assignments, including project relationships, appear on this tab.

Additional examples for marine relationships are as follows:

- For plate and profile system properties, the related bounded objects, bounding objects, and connections are shown.
- For plate and profile system part properties, parent systems are shown.
- For assembly connection properties, all connected objects are shown.
- For the properties of a frame connection on a member, supported, supporting, and auxiliary supporting parts are shown.
- For split connection properties, the parent and auxiliary supporting parts are shown.

Name

Specifies the name of the object.

Type

Specifies the type of object. To change the options on the list, edit the **Weld Type** select list in Catalog.

Go To

Displays the properties of the selected object.

Configuration Tab

Displays the creation, modification, and status information about an object.

 **NOTE** You cannot define the filters using the **Configuration** tab.

Plant


Displays the name of the model. You cannot change this value.

Permission Group

Specifies the permission group to which the object belongs. You can select another permission group, if needed. Permission groups are created in Project Management.

Transfer


Reassigns ownership of the selected model objects from their current permission group to another satellite or host permission group. This option is only available if the active model or project is replicated in a workshare configuration. The option is not available if all of the objects in the select set already belong to another location and are non-transferable. For more information, see *Transfer Ownership Dialog Box* in the *Common User's Guide*.

 **NOTE** The **Transfer** option does not apply to the filters and surface style rules.

Approval State

Specifies the current status of the selected object or filter. The display depends on your

access level. You might be unable to change the status of the object. The list is defined by the ApprovalStatus codelist.

 **NOTE** You can only edit or manipulate an object with a status of **Working**.

Status

Specifies the location of the object in the workflow process. Changing this property sets the **Approval State**. The list is controlled by the ApprovalReason codelist in the ApprovalReason.xls file. You must bulkload this file. For more information, see *ApprovalReason* in the *Reference Data Guide*.

Date Created

Specifies the creation date of the object.

Created by

Specifies the name of the person who created the object.

Date Last Modified

Specifies the date when the object was last modified.

Last Modified by

Specifies the name of the person who last modified the object.

Transfer Ownership Dialog Box

Allows you to specify a new location and permission group for the selected model objects.

Current location

Displays the name of the location with which the current permission group is associated. All of the objects in the select set must belong to the same location.

Current permission group


Displays the name of the permission group with which the selected objects are currently associated. If all of the objects in the select set do not belong to the same permission group, this box appears blank.

New location

Specifies the name of the location to which you want to assign the objects. In a global workshare configuration, this box lists all the locations in which you have write access to one or more permission groups. The selection in this box filters the entries in the **New permission group** box.


New permission group

Specifies the new permission group to which to assign the selected objects. If you specify a value in the **New location** box, this list displays all permission groups to which you have write access in the selected location. If you do not specify a value in the **New location** box, this list includes all permission groups to which you have write access in all locations except the current location. This box is blank if you do not have write access to any permission groups at any locations other than the current one.

 **NOTE** We strongly recommend that administrators follow naming convention rules that include the location as a prefix in the permission group name.

Notes Tab

Creates and edits user-definable text placed by the designer on an object in the model. The notes provide special instructions related to the object for the fabricator and are available in downstream tasks. For example, the notes appear in two-dimensional drawings and within design review sessions.

 **NOTE** Only one note of a given kind from a given object can be shown on a drawing. For example, if there are two fabrication notes on a piping part, then only one of the notes shows on the drawing. It is important to know about and to consider this situation when defining notes on an object in the modeling phase. For example, you can display one Fabrication note and one Installation note by defining two separate labels for the two kinds of notes.

Key point

Specifies the key point on the object to which you want to add a note.

Notes at this location, listed by name

Lists all notes for the selected key point on the object.

Date

Displays the date that the note was created. The system automatically supplies the date.

Time

Displays the time that the note was created. The system automatically supplies the time.

Purpose of note

Specifies the purpose of the note.

Author

Displays the login name of the person who created the note. The system automatically supplies this information. You cannot change this information.

Note text

Defines the note text. The software does not limit the length of the note text.

Show dimension

Indicates that the note generates a dimension.

If you are displaying the properties for a Support component, then a dimension can be included for the component in the Support drawings, if you select the **Show dimension** option. The note must be associated with one of the key points for the Support component. It is recommended that you set the **Purpose of note** as **Fabrication**, but this is not a requirement. The note **Name** and **Note text** are not used when you select this option.

New Note

Creates a new note on the object.

Standard Note

Displays a list of standard notes from which you can select. This feature is not available in this version.

Highlight Note

Highlights the note in the graphic view so that you can easily find the note and the object to which it is related. This feature is not available in this version.

Delete Note

Deletes the currently displayed note.

Glossary

abstract part

A part that is only defined by a partial specification and that cannot be materially provided by the organization that defines the specification.

Active Template Library (ATL)

Set of class templates and wizards supplied with Microsoft C++ Version 5.0 and later. You can use an ATL when you create ActiveX controls and any other type of object that uses the Component Object Model (COM) model. Using an ATL is generally preferred over Microsoft Foundation Classes (MFC), because the implementations are smaller, easier to use, and more closely tied to the COM model.

angle

The circular measurement taken from the intersection of two pipes at a turn or branch.

approval state

Recorded state of acceptance of information contained in objects within the database. The approval states indicate a level of confidence in the information stored in the database and govern your ability to alter specific data about a product.

arrangement (accommodation)

Those components of a system arranged in three-dimensional space with accurate dimensional representation for installation. Various types include electrical, HVAC, machinery, outfitting, and piping.

attribute

A single type of non-graphics information that is stored about an object such as diameter or end preparation.

axis

An imaginary line used to define the orientation of a system or object normally defined in terms of an x-, y-, and z-axis. Some 3-D graphic objects have an associated axis used to define the center or axis for rotations.

basic design

Engineering definition of the model and its systems.

bill of material (BOM)

Hierarchical decomposition of a product into constituent assemblies and parts. Specific types of BOMs exist (for example, an EBOM is a bill of material from the point of view of an engineering department; an MBOM is a bill of material from the point of view of manufacturing).

bulkload

The process by which reference data in Microsoft Excel workbooks is loaded into the Catalog database.

catalog

Repository of information about components and materials used in construction. When you use catalog parts in the model, the software places an occurrence of the catalog part in the project. This occurrence is a copy of the actual catalog part.

Catalog database

The database that contains the reference data. Each model database can reference a different Catalog database.

chain

A set of continuous and tangent segments.

change history

Process of recording information such as who, when, and why for any given modification.

change management

Software features or manual procedures for managing the consequence of change. For example, software can support a change management feature to report drawings that need updating as a result of a change in a 3-D model.

change propagation

Ability of the software to intelligently modify dependent design information to reflect change in a higher order object.

class

Grouping of individual objects that share some very significant, common characteristics.

classification folder

A folder in the Catalog hierarchy that contains part classes. Classification folders are one level above part classes. The ClassNodeType and R-ClassNodeDescribes sheets in the Microsoft Excel workbooks define the classification folders.

codelist

A set of acceptable values for a particular property that can be referred to by an index number or selected in a combo box. For example, the codelist for the material specification allows you to select from a set of standard entries, such as ASTM A183-F316 Stainless Steel.

commodity code

A user-defined code that provides an index to parts in a catalog.

commodity item

A standard component found in a manufacturer catalog (an off-the-shelf component).

component

Physical part that a feature generates.

concurrent access

Ability of the software to allow multiple users to simultaneously access and modify the design of a model.

consolidated tasks

A collection of tasks run in batch. For example, the software allows you to extract a set of drawings immediately or to schedule the batch extraction for a future time.

constraints

A logical restriction that controls how part symbols ports relate to each other and to reference ports. There are four constraints: parallel, perpendicular, coincident, and distance.

contract

A Work Breakdown Structure object representing a scope of work, usually performed by an external supplier. The contract is related to a project and appears in the Work Breakdown Structure hierarchy.

coordinate

The location of a point along the X-, Y-, or Z-axis.

coordinate system

A geometric relation used to denote the location of points in the model. The most common coordinate system is the rectangular coordinate system, whereby points are located by traversing the X-, Y-, and Z-axes of the model. Normally, coordinate systems have their origin defined as 0,0,0.

cutting plane

A plane that cuts through an object.

damage records

Data relating to the damage and repair of structure or components that occurred during or after construction of a plant.

data interchange

Capability to output the design, or portions of the design, in a standard format for use or movement to another computer software system.

database

Repository for the product model data. The database contains information to describe individual objects in the data model and the relationships between objects as appropriate.

database backup

Process of recording a backup copy of the complete database or the incremental changes after the date that the last complete copy was created.

database break and recovery

Utilities used to restore a database after files are corrupted.

database copy

Functionality to copy large collections of model objects from one design project to another design project.

database management

Functionality related to managing a product model database.

database monitor record

Transactions that occur in order to provide database (DB) recovery after a stop in response with a minimum of lost data.

degree

The highest polynomial factor in the curve or surface mathematical definition. A line is a degree 1 curve, while a cubic B-spline is a degree 3 curve.

design alternative

Difference in a design represented by a separate version. A design alternative can be a new design prepared as a proposed change, or one of several elective options that the builder or customer selects. Each design alternative has an identification assigned so you can uniquely refer to the design alternatives.

design approval log

Record of review and approval of parts of the design.

design data auto input

Automation in loading existing design data into a new design database.

design documents

Drawings, sketches, material lists, procedures, and so forth that are generated during the design phase.

design object

Any object with properties that you can select. A design object can be related to one or more contracts of different types, but related only to one contract of a given type.

design progress check

Analysis of the content of the design to some metric unit that gives an idea of the degree of completion.

design review

Functionality to support rapid viewing of the design and markup of features with comments.

design service

Any general system services related to the design function.

design standard

Feature or object used in plant design that has been determined to the normal or approved way of accomplishing a design requirement. In the context of computer software, the term refers to computer functionality to support standards, not the standard itself.

detail schedule

Lowest level of schedule used to manage and track work progress.

distributed systems

Systems consisting of sequential parts with a distributive characteristic (for example, pipes distribute fluids, HVAC distributes air, cabling distributes power, and structure distributes loads).

distribution systems

Term synonymous and used interchangeably with the term distributed systems.

documentation

Drawings and other records that you must produce to document, obtain approval, or build the design.

drawing tool

Tool that helps in the process of creating, modifying, or manipulating objects. Examples are PinPoint and SmartSketch.

easting

A term that describes an east coordinate location in a coordinate system.

edge

A topological object that represents a trimmed curve bounded by a start and end vertex.

edge distance

The distance from the center of a bolt or rivet to the edge of a plate or flange.

equipment catalog

Catalog of equipment geometry and limited properties that the software uses to identify and visualize equipment and its placement in the model. The catalog is not the source for the total specification and ordering data for the object.

fabricate

To cut, punch, and sub-assemble members in the shop.

face-to-face

The overall length of a component from the inlet face to the outlet face.

fasteners

Bolts and rivets used to connect structural members.

element

Primitive geometric shape such as a line, circle, or arc.

fence

Boundary or barrier that separates or closes off an area. To surround or close like a fence.

field adjustment

Material added to the neat design geometry of piping or structural parts to allow for fit up in the case that extra material is required due to uncontrolled variance in the manufacturing and construction process.

flavor

A different variation of a symbol. Each variation has different occurrence property values.

focus of rotation

A point or line about which an object or view turns.

full penetration weld

A type of weld in which the weld material extends through the complete thickness of the components being joined.

function points

Part of the requirements documentation, function points are the smallest granularity of a requirement statement that describe specific detailed actions that the software performs.

functional block diagram

Schematic representation of a system (piping, electrical, ventilation) showing system parts and their relationship. You use symbols to represent equipment and components. A connecting network of lines illustrates their relationship. Taken together, the symbols and the network illustrate the function of the system.

furnishings

Parts such as movable articles and fittings that normally are not associated with a system (for example, a chair).

generic specific

Object that is parametrically defined or defined to suit a family of specific parts (for example, International Standards parametrics). For example, a 100 - 200 gpm pump in the catalog can provide a general shape to appear in the model until a specific object has been identified. See also specific and specific object.

GUIDs

Acronym that stands for Globally Unique Identifiers. The software automatically creates the GUIDs sheet in the Excel workbooks when you create the Catalog database and schema. The purpose of storing GUIDs within Excel workbooks is to help you keep track of what has been loaded into the database. Storing GUIDs also helps to avoid the situation in which a replacement Catalog database causes existing models to become invalid.

host location

The first location created for a Site. This host location is defined when the Database Wizard creates the Site database.

host server

The database server on which the Site database was created using the Database Wizard. Alternatively, if it is a restored database set, the Host Server is the database server where the Site database is restored. The Host Server in a Workshare environment contains the origin for the Site, Site Schema, Catalog, and Catalog Schema databases. Consequently, most Project Management and reference data work must take place at the Host.

initial design

Early stage of design work, generally before contract, used to estimate construction costs and provide a rough concept of the intended plant. Contains information relating to a plant created during its initial (concept) design period.

initial structural plan

Principal structural plan for the plant; also called a construction profile.

instantiation

Occurrence of a catalog object at a specific geometric location in the model.

interference checking

A process that identifies possible collisions or insufficient clearance between objects in the model.

job order

Industrial authorization for accomplishing work; synonymous with a work order.

kinematics analysis

Analysis of mechanical motion.

ksi

Kips per square inch.

leg length analysis

Preferred term is welding length analysis.

library

Resource of reference information that you can access in developing a plant design.

life cycle database

Information developed to assist in the maintenance and modernization of delivered plants.

link

Way to store information about another file in your document. You can update a link so that changes in the file appear in your document.

lintel

A horizontal member used to carry a wall over an opening.

load group

A grouping in which all components feature uniform load limits and stress safety characteristics. For example, if a pipe clamp from load group 5 has a maximum nominal load of 20kN, then so does a threaded rod from load group 5.

location

A Location is defined by three user-defined inputs: 1) a unique name, 2) a unique name rule ID, and 3) the server where the Site databases reside for that Location. A Location is defined and created when the Site database is created using the Database Wizard. Additional Locations can be created in the Project Management task. Each Location is a Site-level object, thus other Plants within the same Site collection can use the Locations when the Plants are configured for Workshare.

logical member

An object in the model used to represent the design topology.

machinery

Major pieces of equipment installed in a plant.

macro

A sequence of actions or commands that can be named and stored. When you run the macro, the software performs the actions or runs the commands. You can create the macros in Visual Basic or other OLE-aware programming applications. Some of the other OLE-aware programming applications are Visual Basic for Applications, Visual C++, and so forth.

maintenance envelope

A rectangular box around the part for clearance during maintenance operations.

maintenance records

Records of breakdown, repair, and overhaul of equipment.

material analysis

Analysis of a completed design work for extracting detailed material requirements; also called material lists.

material list

An option category that controls the format and content of the bill of materials.

methods

Objects in the database that describe the manufacturing methods to the component parts of a plant.

move from point

Starting point for an action. For example, when you move an equipment object, the Move From point determines the point of origin for the move.

move to point

Ending point for an action. For example, when you move an equipment object, the Move To point determines where you want the move to stop.

MTO neutral file

A non-graphic output file that can be fed into a material control system. MTO stands for Material Take-Off.

node

- One of the set of discrete points in a flow graph.
- A terminal of any branch of a network or a terminal common to two or more branches of a network.
- An end point of any branch or a network or graph, or a junction common to two or more branches.

northing

A term that describes a north coordinate location in a coordinate system.

nozzle

A piping connection point to a piece of equipment.

nozzle standout

The shortest allowable distance between the connection point of a nozzle and the start point of a turn on the leg connected to the nozzle.

NPD (Nominal Piping Diameter)

The diameter of a pipe.

object

A type of data other than the native graphic format of the application.

occurrence (of part or equipment)

Instantiation of a part of equipment in the model that refers to the part library; an instance of a specific object. The design can be built several times, and therefore the occurrence can apply to more than one hull. Typically, an occurrence points back to a specific object, either for its complete definition, as in the case of a particular valve, or for its made from material, as in the case of a steel plate part cut from sheets. Thus, when a designer selects a component from the catalog and places it at a location in the space of the plant, the software creates an occurrence of that object in the plant design.

occurrence property

A characteristic that applies to an individual object in the model. Occurrence properties are designated with 'oa:' in the reference data workbooks. You can view and modify occurrence properties on the Occurrence tab of the properties dialog boxes in the software. Depending on the object, some occurrence properties are read-only.

origin

In coordinate geometry, the point where the X-, Y-, and Z-axes intersect.

origin point

The point at which the coordinate system is placed, providing a full Cartesian coordinate system with positive and negative quadrants. Points are placed at coordinates relative to the origin point, represented by the X, Y, and Z values.

orthogonal

The characteristic of an element consisting completely of elements positioned at 90-degree angles. A square is an orthogonal element.

orthographic

A depiction of an object created by projecting its features onto a plane along lines perpendicular to the plane.

P&ID

Diagram that shows the topology, functional components, and special requirements of a piping system; generally represents the engineering design of the system.

package

Set of closely related classes. (UML)

painting

Computation of paint surface and recording of paint system requirements.

parameter

A property whose value determines the characteristics or behavior of something.

part class

A group of similar objects. You can define part classes in the Excel workbooks. A part class can have multiple parts. For example, a heat exchanger part class can contain heat exchangers with different dimensions.

part number

Unique identifier of a part.

PDS (Plant Design System)

A comprehensive, intelligent, computer-aided design and engineering application for the process, power, and marine industries. PDS consists of integrated 2-D and 3-D modules that correspond to engineering tasks in the design workflow.

PinPoint

Tool that allows you to place, move, and modify elements with precision, relative to a reference point.

principle of superposition

The principle that states that the stresses, strains, and displacements due to different forces can be combined. This principle is only valid for linear analysis.

Product Data Management (PDM) System

Software intended to manage both product data and documents associated to the product data. Functionality typically includes: object-based data modeling tools, user administration, business rules, and document management. Document management typically includes document editing or reviewing, document mark-up or redline, document storage, and full-text retrieval.

product structure

Hierarchical breakdown or decomposition of a product into constituent parts, volumes, or units. (For example, a bill of material is one possible type of product structure.)

production planning

Functionality associated with the work breakdown and sequence of the construction of a plant.

promotion

Process of associating approval state with a product version. A product version begins its existence at a working approval state. When the version is at some level of maturity, its approval state is elevated to a higher approval state (that is, promoted). Then, further changes must be carefully controlled and generally require the data set demoted to a working state. One or more promotions can occur successively higher approval states (between working and approved) to represent various intermediate levels of review or progressive approval.

query select sets

Set of objects that are selected in a query or queries on the database.

reference data

The data that is necessary to design plants or ships using the software. Reference data includes graphical information, such as symbols. It also contains tabular information, such as physical dimensions and piping specifications.

resource estimation

Rough estimate of material, manpower, and facility utilization for the design and construction of the plant.

route

1) A line connecting a series of points in space and constituting a proposed or traveled route. 2) The set of links and junctions joined in series to establish a connection.

satellite server

The database server where the replicated databases reside for Workshare. The Satellite Server is not used unless Workshare is activated.

schema

A database that creates the structure of another database. For example, a schema specifies the queries, tables, fields, and data types in a database.

schema update utility

Functionality used to assist in processing existing product models to an updated database structure after you modify or add to the database structure.

site

The top level in the Project Management hierarchy. A Site configuration may contain several Catalogs, each shared by multiple Plants.

site administrator

Person responsible for managing the standards and general parameters for a given plant site within a Site database.

site setup

Functionality associated with establishing a new plant site or hull for design development.

sketch and trace

User interface for rough definition of a required design feature that typically works in a 2-D mode.

specifications

Contracted requirements for the plant.

stud

A bolt, threaded on both ends, used to connect components.

suspended floor

A concrete floor system built above and off the ground.

symmetric node

Type of vertex on a curve. A curve with a symmetric node has the same curvature on each side of the node. A handle can be attached to a symmetric node for editing.

system

A conceptual design grouping that organizes parts in hierarchical relationships. A system represents a functional view of the model and includes information such as system name, type, properties, and design specifications for the objects assigned to the system.

tag number

User-specific, unique number assigned to an object (for example, CV-101 for a control valve, HE-2002 for a heat exchanger).

target point

The origin for coordinate measurements displayed by PinPoint. You can position the target point anywhere on the drawing sheet or view.

tolerant geometry

A type of ACIS geometry - either an edge or a vertex - that is outside the tolerance for ACIS and requires special handling.

trimmed surface

A surface whose boundary is fully or partially inside the "natural" geometric definition of the surface. Some or the entire control polygon extends outside the face boundary.

trunk

Feature that quickly reserves space for the distributive systems and other systems that have a path. Along the trunk are stations that define the cross section and identify part or system membership.

unit/module modeler

Facility of the system to structure collections of equipment and components into a single identifiable object.

user attributes

A customized property in the reference data. The Custom Interfaces sheets in the Excel workbooks define these properties. You can list the customized properties on the individual part class sheets.

version control

Ability of the system to manage multiple versions of a single part of the design. Version control should support conditional analysis and promotion status, as well as alternate design features among hulls within a plant site.

vertex

A topological object that represents a point in the three-dimensional model.

viewset

Set of objects (usually a subset of the entire database) that a view operation uses. Membership or lack of membership for any object in a viewset does not affect the actual stored representation of the object, but only its availability or desirability for viewing in the current scenario.

weight and CG analysis

Routines that compute the weight of commodity materials as configured in a given design (for example, plate and pipe) and determine total weight and center of gravity (CG) for a collection of material and equipment, as well as the complete plant.

welding

Weld requirements for joining materials. Welding length analysis is the calculation of required weld dimensions; also called leg length analysis.

wirebody

A topological object that represents a collection of edges jointed at their common endpoints.

wizard

Software routine attached to an application that provides guidance and expert help to you to complete one of the functionalities of the application.

work content

Estimation development of metrics from the database that relates to the work hour content of the various construction units.

work order

Plant authorization for completing work; synonymous with a job order.

working plane

The available 2-D plane of movement for endpoint selection.

workset

Set of objects (usually a subset of the entire database) used in an interactive change, add, or delete operation. Membership or lack of membership for any object in a workset does not necessarily affect the actual stored representation of an object. However, you can change or delete an object in a workset that also results in a change or deletion of the stored object. Similarly, when you add a new object (not currently stored) to a workset, the software also adds the object container.

workspace

Area that represents the portion of the model data needed to perform the intended task and includes the user modeling settings.

workspace document

Document into which you can extract a portion of the model data for a user task.

Workspace Explorer

Tree or list representation of objects in your workspace.

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